

SUPPORT FOR THE AMENDMENTS

Claim 1 has been amended for clarity. Accordingly, no new matter is believed to have been added to the present application by the amendments submitted above.

REMARKS

Claims 1 and 6-24 are pending, with Claims 1 and 6-10 under active consideration. Favorable reconsideration is respectfully requested.

As set forth in Claim 1, the present invention relates to an organosilane-based composition for producing a barrier layer for gases, comprising at least one of composition (A), composition (B) and composition (C), wherein:

composition (A) comprises:

- (i) at least one organoalkoxysilane having at least one unsaturated hydrocarbon group;
- (ii) at least one aminoalkylalkoxysilane;
- (iii) at least one polyol;
- (iv) optionally a further alkoxysilane or alkoxysiloxane;
- (v) optionally at least one nano- or microscale semimetal oxide or metal oxide, semimetal oxide hydroxide or metal oxide hydroxide, or semimetal hydroxide or metal hydroxide; and
- (vi) an organic solvent;

composition (B) comprises at least one cocondensate of the at least one organoalkoxysilane, the at least one aminoalkylalkoxysilane, the at least one polyol, optionally the further alkoxysilane or alkoxysiloxane and optionally the at least one nano- or microscale semimetal oxide or metal oxide, semimetal oxide hydroxide or metal oxide hydroxide, or semimetal hydroxide or metal hydroxide, and the organic solvent;

composition (C) comprises a reaction product produced under hydrolysis conditions of the at least one organoalkoxysilane, the at least one aminoalkylalkoxysilane, the at least one polyol, optionally the further alkoxysilane or alkoxysiloxane and optionally the at least

one nano- or microscale semimetal oxide or metal oxide, semimetal oxide hydroxide or metal oxide hydroxide, or semimetal hydroxide or metal hydroxide, and the organic solvent;

the components of composition (A) and/or the precursors of composition (B) and composition (C) are present such that a molar ratio of the at least one organoalkoxysilane: the at least one aminoalkylalkoxysilane: the at least one polyol is 1 : 0.5 to 1.5 : 0.3 to 1.1;

the at least one organoalkoxysilane is at least one member selected from the group consisting of: vinyltrimethoxysilane, vinyltriethoxysilane, 3-methacryloxypropyltrimethoxysilane, 3-methacryloxypropyltriethoxysilane, 3-methacryloxypropylmethyldimethoxysilane, vinylmethyldimethoxysilane, vinylmethyldiethoxysilane, 3-methacryloxypropylmethyldiethoxysilane, 3-acryloxypropyltrimethoxysilane, 3-acryloxypropyltriethoxysilane, 3-acryloxypropylmethyldimethoxysilane, and 3-acryloxypropylmethyldiethoxysilane;

the at least one aminoalkylalkoxysilane is at least one member selected from the group consisting of 3-aminopropyltrimethoxysilane, 3-aminopropyltriethoxysilane, N-phenyl-3-aminopropyltrimethoxysilane, N-phenyl-3-aminopropyltriethoxysilane, N-butyl-3-aminopropyltrimethoxysilane, N-butyl-3-aminopropyltriethoxysilane, N-methyl-3-aminopropyltrimethoxysilane, N-methyl-3-aminopropyltriethoxysilane, N-(2-aminoethyl)-3-aminopropyltrimethoxysilane, N-(2-aminoethyl)-3-aminopropyltriethoxysilane, N,N-di(2-aminoethyl)-3-aminopropyltrimethoxysilane, N-[N'-(2-aminoethyl)-2-aminoethyl]-3-aminopropyltrimethoxysilane, N,N-di(2-aminoethyl)-3-aminopropyltriethoxysilane, N-[N'-(2-aminoethyl)-2-aminoethyl]-3-aminopropyltriethoxysilane, 3-aminopropylmethyldimethoxysilane, 3-aminopropylmethyldiethoxysilane, N-butyl-3-aminopropylmethyl-dimethoxysilane, N-butyl-3-aminopropylmethyldiethoxysilane, N-(2-aminoethyl)-3-aminopropylmethyldimethoxysilane, N-(2-aminoethyl)-3-aminopropylmethyldiethoxysilane, N,N-di(2-aminoethyl)-3-

aminopropylmethyldimethoxysilane, N-[N' (2-aminoethyl)-2-aminoethyl]-3-aminopropylmethyldimethoxysilane, N,N-di(2-aminoethyl)-3-aminopropylmethyldiethoxysilane, and N-[N'-(2-aminoethyl)-2-amino-ethyl]-3-aminopropylmethyldiethoxysilane;

the at least one polyol is at least one member selected from the group consisting of glucose, xylitol, mannitol, sorbitol, resorcinol, pyrogallol, hydroquinone, salicylic acid, and glycerol.

Rejections Under 35 U.S.C. §103

A. Nanavati and Wyman

The Office Action rejects claims 1 and 8-10 under 35 U.S.C. §103(a) over WO 01/66655 to Nanavati ("Nanavati") in view of U.S. Patent No. 5,077,135 to Wyman ("Wyman"). Applicants respectfully traverse the rejection. The combination of Nanavati and Wyman do not disclose or suggest a composition as specified in Claim 1, discussed above.

The Office Action asserts that it would have been obvious to employ the vinyl triethoxy silane of Wyman into the Nanavati because the coating of Wyman is smooth and uniform. *See* Office Action, page 14. However, the Office Action fails to explain how the vinyl triethoxy silane contributes to the smoothness and uniformity of the coating of Wyman or why one of ordinary skill in the art would reasonably expect that such vinyl triethoxy silane could be successfully incorporated into the different combination of components in Nanavati.

Likewise, the Office Action asserts that it would have been obvious to employ the pyrogallol of Nanavati into the coating Wyman because the coating of Nanavati has unique physical characteristics. *See* Office Action, page 14. However, the Office Action again fails to explain how the pyrogallol contributes to the unique physical characteristics of the coating of Nanavati or why one of ordinary skill in the art would reasonably expect that such

pyrogallol could be successfully incorporated into the different combination of components in Wyman.

The Office Action apparently takes the view that it would have been obvious to make any combination of components that have previously been used in barrier layers, merely because they have previously been used in barrier layers. This, however, is not the law of obviousness. *See, e.g., Ex parte Whalen*, 89 USPQ2d 1078, 1084 (Bd. Pat. App. & Int. 2008) ("[t]he *KSR* Court noted that obviousness cannot be proven merely by showing that the elements of a claimed device were known in the prior art; it must be shown that those of ordinary skill in the art would have had some 'apparent reason to combine the known elements in the fashion claimed'").

With respect to the molar ratio in claim 1, the Office Action asserts that "one of ordinary skill in the art would be motivated by common sense to select a 1:1 ratio." *See* Office Action, page 15. Applicants submit that the Office Action has provided no basis for this allegation of what would constitute "common sense." A martini includes gin and vermouth, but employing such ingredients in a 1:1 ratio can hardly be considered common sense.

In the absence of such "common sense," a molar ratio of at least one organoalkoxysilane to at least one aminoalkylalkoxysilane to at least one polyol must first be recognized as a result-effective variable before the determination of workable ranges can be said to be an obvious variation. *See, e.g.,* MPEP §2144.05.II.B (citing *In re Antonie*, 195 U.S.P.Q. 6 (C.C.P.A. 1977)). The Office Action fails to identify, in any of the cited references, recognition that the molar ratio in claim 1 is a result-effective variable.

Any alleged *prima facie* of obviousness is rebutted by the results shown in the present specification -- "[a] *prima facie* case of obviousness ... is rebuttable by proof that the claimed compounds possess unexpectedly advantageous or superior properties." *See* MPEP §2144.09 (citing *In re Papesch*, 315 F.2d 381 (C.C.P.A. 1963)). The Examples of the present specification demonstrate that compositions that do not include each of components (i), (ii) and (ii) (Comparative Example 1) or that do not include components (i), (ii) and (ii) in the molar ratio required in claim 1 (Comparative Example 2) result in barrier layers with inferior oxygen permeation to barrier layers formed from compositions according to claim 1. *See, e.g.,* present specification, pages 10 to 15. These results are objective evidence of the improvements of the composition of claim 1 over known compositions as in Nanavati and Wyman, and thus these results rebut any suggestion that it would have been obvious to combine the teachings of Nanavati and Wyman as proposed in the Office Action.

As explained, claim 1 would not have been rendered obvious by Nanavati and Wyman. Claims 8-10 depend from claim 1 and, thus, also would not have been rendered obvious by Nanavati and Wyman. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

B. Nanavati, Wyman, Ichikawa and Komada

The Office Action rejects claim 6 under 35 U.S.C. §103(a) over Nanavati in view of Wyman, U.S. Patent No. 4,735,832 to Ichikawa et al. ("Ichikawa") and U.S. Patent Application Publication No. US 2001/0038894 to Komada ("Komada"). Applicants respectfully traverse the rejection.

For the reasons discussed above, Nanavati and Wyman fail to disclose or suggest each and every feature of claim 1. Ichikawa and Komada fail to remedy the deficiencies of Nanavati and Wyman. Ichikawa is cited for its alleged disclosure of a barrier layer having

low permeability to oxygen and carbon dioxide. *See* Office Action, page 7. Komada is cited for its alleged disclosure of a gas barrier film including tetraethoxysilane. *See* Office Action, page 8. However, Ichikawa and Komada, like Nanavati and Wyman, fail to disclose or suggest a composition including components (i), (ii) and (ii) in the molar ratio required in claim 1. Accordingly, the combination of references fails to disclose or suggest each and every feature of claim 1.

As explained, claim 1 would not have been rendered obvious by Nanavati, Wyman, Ichikawa and Komada. Claim 6 depends from claim 1 and, thus, also would not have been rendered obvious by Nanavati, Wyman, Ichikawa and Komada. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

C. Nanavati, Wyman and Huffer

The Office Action rejects claim 7 under 35 U.S.C. §103(a) over Nanavati in view of Wyman and U.S. Patent Application Publication No. US 2002/0146525 to Huffer et al. ("Huffer"). Applicants respectfully traverse the rejection.

For the reasons discussed above, Nanavati and Wyman fail to disclose or suggest each and every feature of claim 1. Huffer fails to remedy the deficiencies of Nanavati and Wyman. Huffer is cited for its alleged disclosure of a barrier coating including aluminum oxide. *See* Office Action, page 8. However, Huffer, like Nanavati and Wyman, fails to disclose or suggest a composition including components (i), (ii) and (ii) in the molar ratio required in claim 1. Accordingly, the combination of references fails to disclose or suggest each and every feature of claim 1.

As explained, claim 1 would not have been rendered obvious by Nanavati, Wyman and Huffer. Claim 7 depends from claim 1 and, thus, also would not have been rendered

obvious by Nanavati, Wyman and Huffer. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

D. Wyman and Nanavati

The Office Action rejects claims 1 and 8-10 under 35 U.S.C. §103(a) over Wyman in view of Nanavati. Applicants respectfully traverse the rejection. For the reasons discussed above, Nanavati and Wyman fail to disclose or suggest each and every feature of claim 1.

As explained, claim 1 would not have been rendered obvious by Wyman and Nanavati. Claims 8-10 depend from claim 1 and, thus, also would not have been rendered obvious by Wyman and Nanavati. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

E. Wyman, Nanavati, Ichikawa and Komada

The Office Action rejects claim 6 under 35 U.S.C. §103(a) over Wyman in view of Nanavati, U.S. Patent No. 4,735,832 to Ichikawa et al. ("Ichikawa") and U.S. Patent Application Publication No. US 2001/0038894 to Komada ("Komada"). Applicants respectfully traverse the rejection.

For the reasons discussed above, Wyman, Nanavati, Ichikawa and Komada fail to disclose or suggest each and every feature of claim 1.

As explained, claim 1 would not have been rendered obvious by Wyman, Nanavati, Ichikawa and Komada. Claim 6 depends from claim 1 and, thus, also would not have been rendered obvious by Wyman, Nanavati, Ichikawa and Komada. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

F. Wyman, Nanavati and Huffer

The Office Action rejects claim 7 under 35 U.S.C. §103(a) over Wyman in view of Nanavati and U.S. Patent Application Publication No. US 2002/0146525 to Huffer et al. ("Huffer"). Applicants respectfully traverse the rejection.

For the reasons discussed above, Wyman, Nanavati and Huffer fail to disclose or suggest each and every feature of claim 1.

As explained, claim 1 would not have been rendered obvious by Wyman, Nanavati and Huffer. Claim 7 depends from claim 1 and, thus, also would not have been rendered obvious by Wyman, Nanavati and Huffer. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

The rejection of the claims under 35 U.S.C. §112, first paragraph, is believed to be obviated by the amendment submitted above. The language of Claim 1 has been clarified. Moreover, specific organoalkoxysilanes are specified in Claim 1, mooted any issue of indefiniteness. Accordingly, withdrawal of this ground of rejection is respectfully requested.

Regarding the withdrawn claims, Applicants note that those claims depend from the allowable claims subject to examination. Accordingly, since the withdrawn claims thus recite all features of allowable claims, the withdrawn claims are allowable as well. Accordingly, rejoinder of the withdrawn claims is respectfully requested.

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Applicants submit that the present application is in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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